Summary

* The classification "Broadband" should not apply to a specific delivery method or technology but rather to the ability of the platform to meet certain minimum performance characteristics.

* The downstream bandwidth can be no less than 6144 Kbps.

* The upstream bandwidth can be no less than 1/4 of the advertised downstream bandwidth.

* No less than 60% of the advertised bandwidth should be available to the consumer at least 75% percent of the time and the full bandwidth advertised should be available no less than 40% of the time for providers offering service by a rate (i.e. 10 Mbps) or a range (i.e. 8-10 Mbps). In the case of a provider offering a range, the range can not be a spread of more than 10% and the lower of the two values is used. If a provider is using a bursting technology, the provisioned rate is to be used.

* Providers offering service based on a transfer rate or transfer rate range must include the actual upper and if using a range, the lower provisioned rates. Any provider using a burst technology is free to advertise that feature and it's capabilities, but must do so in addition to providing the provisioned (sustained) rates.

* Maximum of 150 ms round-trip latency between a subscriber in the continental United States and any other point in the continental United States. Subscribers located in Hawaii and Alaska should expect no more than 180 ms round-trip latency to any point in the continental United States.

* Less than 1 in 1000 (.001 %) loss in TCP end-to-end packets.

Classification

This is strictly a personal opinion, but I don't believe the term "Broadband" should be specific to any delivery method or technology but rather the ability of that platform to deliver certain performance characteristics. Consumers such as myself have a lot of things going on in their life, the simpler the terminology can be made the better and the easier it will be to compare service offerings. A consumer such as myself should be able to know a couple of words or classifications (possibly at the recommendation of friends, co-workers) and be able to shop confidently for a provider that provides that

service. Ideally there should be a couple of different classifications (levels) and those can be used by providers when advertising their service offering and only advertised if their offering meets the requirements. The classifications used would be the same independent of the technology such as FTTH, FTTN, Cable, Wireless, etc.

Bandwidth

Bandwidth is a very difficult subject as it indirectly controls the required infrastructure and supporting interconnects but it is also the most crucial to properly define to allow growth and alternative service options in my opinion. Real world examples are important, one such example is a NetFlix HD movie which has an average encode rate of 3800 Kbps or roughly 1.7 GB of data transferred per hour. Considering the US Census Bureau estimates there are on average of 2.59 individuals per household as of 2000 (latest available via their web site), I believe a consumer should be able to watch two NetFlix like HD streams simultaneously. That would seem to indicate that a downstream rate of 7600 Kbps, but I would be willing to compromise and suggest a minimum downstream rate of 6144 Kbps to allow 6 Mbit DSL to continue to qualify for the moment. While this may seem high to some initially, the reality is the more "enthusiast" crowd already exceeds this usage with the majority of users going down the same path in the not so distant future.

Upstream Bandwidth

Upstream bandwidth seems from the outside to be something that is generally an afterthought with providers, but what must be remembered is the Internet started out and continues to be a way for two-way communication to occur. Most progressive providers seem to offer roughly at least a 1/6 ratio of upstream to downstream bandwidth and while I personally believe it should be symmetrical or at least half of the downstream, a 1/4 ratio in my opinion seems to be a good compromise. Regardless of the ratio used, a ratio for upstream capabilities is essential in my opinion and needs to take in to consideration the protocol overhead for the downstream as well as the ability to effectively contribute to discussions. A 256 Kbps upstream will be able to upload that movie of the family picnic, but it will be awfully slow.

Quality of Service

The downstream bandwidth and upstream bandwidth capabilities are important, but they are meaningless without a certain expectation of availability. While I would like to say that the bandwidth advertised should be available 24/7/365 to all subscribers, I

also understand that is not realistic. This is an arbitrary number on my part, but I believe that no less than 60% of the advertised bandwidth should be available to the consumer at least 75% percent of the time and the full bandwidth advertised should be available no less than 40% of the time for providers offering service by a rate (i.e. 10 Mbps) or a range (i.e. 8-10 Mbps). In the case of a provider offering a range, the range can not be a spread of more than 10% and the lower of the two values is used. If a provider is using a bursting technology, the provisioned rate is to be used.

I do also want to acknowledge that this is probably one of the hardest items to develop a measurement system that is both fair to the consumers and the providers. Anyone need a technology consultant? ;)

Advertising

Advertising I understand is an art, but consumers need a few base lines to help navigate the market. One such need is for providers using a bursting technology such as Comcast's PowerBoost technology, while in itself is very useful and not a gimmick but the advertising that surrounds it cannot say the same. Providers offering service based on a transfer rate or transfer rate range must include the actual upper and if using a range, the lower provisioned rates. Any provider using a burst technology is free to advertise that feature and it's capabilities, but must do so in addition to providing the provisioned (sustained) rates.

Latency

A practical example of a latency sensitive application is voice over IP (VoIP) communications which as per the ITU-T G.114 recommendation advises that a connection using VoIP should have an end-to-end latency of less than 150 ms one-way to avoid degraded performance. As this is an upper limit, I recommend that this value be cut in half which would give a end-to-end latency of 75 ms which is still a great deal higher than any SLA that many commercial transit providers offer. With that recommendation, a maximum round trip latency of 150 ms would be expected between any two points in the continental United States. Realistically, this is still a high value as one can typically expect around 85 ms round-trip latency today between the east and west coasts of the United States, but the assumption is that a minimum value is being targeted.

Packet Loss

The simple answer is there should never be end-to-end TCP protocol based packet loss, however I believe some performance metric should be provided.

Sources

ITU-T G.114 Recommendation - http://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.114-200305-I!!PDF-E&type=items
NetFlix Encoding - http://blog.netflix.com/2008/11/encoding-for-streaming.html
US Census Quick Facts - http://quickfacts.census.gov/qfd/states/00000.html
VoIP QoS - http://www.voip-info.org/wiki/view/QoS